



Maryland

Department of
the Environment

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor

Ben Crumbles, Secretary
Horacio Tablada, Deputy Secretary

SUMMARY REPORT & FACT SHEET

Permit Application Numbers: State: 15-DP-0581 NPDES: MD0021555

Name of Facility: Back River Wastewater Treatment Plant

Mailing Address: 8201 Eastern Boulevard, Baltimore, Maryland 21224

Facility Organization: City of Baltimore, Department of Public Works

Contact Person's Name: Marshall Phillips

-Title: Plant Manager

-Phone: 410-396-9814

Applicant engaged in: The Treatment of Municipal Wastewater

Number of outfalls: 001A- Effluent to Back River SIC Code: 4952
002A- Effluent to Bear Creek thru
High Head Lake at Sparrows Point,
Trade point Property

MDE Engineer: Mahendra Chawla

7/19/17
Revised 6/6/17
Completion Date: 2/28/17

Reviewed by: _____
{Permit Reviewer Name}

Date

Reviewed by: Curtis H. Dalton
Curtis H. Dalton, P.E., Chief
Technical Services Division}

3/1/17

Date

Accepted by: Yen-Der Chang
Yen-Der Chang, Chief
Municipal Surface Discharge Permits Division

3/2/17

Date

Is EPA joint review required? Yes ☒, Date sent: 3/2/17 No ☐

State/EPA comment/agreement received: Yes ☒ Date received: 3/24/17 N/A ☐

Table of Content

<u>NO.</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
I.	DESCRIPTION OF FACILITY, OUTFALL AND RECEIVING STREAM	3
	Facility Background and Description	
	Wastewater Treatment Processes	
	Outfall Details	
	Receiving Stream Description and Properties	
	Plant Performance Data	
II.	SPECIAL REQUIREMENTS & CONDITIONS	7
	85% Reduction Requirement for BOD ₅ and Total Suspended Solids	
	Enhanced Nutrient Removal (ENR) Requirements	
	TMDL Implementation Requirements	
	Effluent Biotoxicity testing review for Whole Effluent Toxicity (WET)	
	Toxic Substances Testing Review	
	Wastewater Capacity Management	
	Pretreatment Program/Influent Restrictions	
	Reapplication Due Date	
	Temperature Requirements	
	WWTP use lagoon(s) for wastewater treatment	
	Emergency holding pond requirement	
III.	PROPOSED EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS	13
	Proposed Effluent Limitations	
	Proposed Monitoring Requirements	
	Regulations, Rationale and Discussion	
	Anti-backsliding Policy Review	
	Anti-degradation Policy Review	
IV.	CHRONOLOGICAL LOG OF ACTIVITIES	22
V.	MAP SHOWING DISCHARGE POINT LOCATION	23
VI.	APPENDIX- A (Previous Effluent Limitations and Monitoring Requirements)	24

I. Description of Facility, Outfall and Receiving Stream**Description of Facility & Outfall(s)**

<u>Details for Facility:</u>	
POTW <input checked="" type="checkbox"/>	Privately Owned Facility <input type="checkbox"/>
EPA MAJOR <input checked="" type="checkbox"/>	EPA MINOR <input type="checkbox"/> Chesapeake Bay Significant <input type="checkbox"/>
Service Area Brief Description: The facility serves City of Baltimore and Baltimore County	
Population Served: <u>974,199</u> , 5-year projection flow: <u>152.0 MGD</u>	
The proposed discharge flow of <u>180.0</u> Million Gallons per Day (MGD) is consistent with the capacity listed in the latest Baltimore City's Comprehensive/Master Water and Sewer Plan, as amended and adopted in 2006 by the Baltimore City, and approved by MDE's Water Resources Planning Program. It is also in conformance with the State's Smart Growth initiatives.	
Current Design Capacity of the Facility: 180.0 MGD	
Which of the following documents were used as the base of the design capacity? (Check boxes as appropriate.)	
<input type="checkbox"/> Construction Permit (Issued by MDE),	<input checked="" type="checkbox"/> Most updated W/S Plan (2006)
<input type="checkbox"/> Permit Application	<input type="checkbox"/> Other (Specify)
<i>Additional comments on the plant capacity: {Examples: future expansion, significant I/I affecting plant capacity, etc.}</i>	
Type of Discharge: <input checked="" type="checkbox"/> Surface Discharge,	Discharge Period: <u>12 months (January – December)</u>
<input type="checkbox"/> Groundwater Discharge,	Discharge Period: <u>12 months (January – December)</u>
<i>Continuous discharge</i>	
<u>Wastewater Treatment Processes:</u>	
The Back River Wastewater Treatment Plant uses 6 Mechanical screens, 4 grit removal units, 11 primary settling tanks, 3 activated sludge plant trains, 28 final clarifiers, 48 sand filtration tanks and disinfection to treat the wastewater. Sludge is thickened by 2 air floatation thickeners, 5 gravity belt thickeners and 6 gravity sludge thickeners and digested by 2 Egg shaped digesters and 6 high rate digesters. Centrate from the centrifuge and heat drying facility is sent to the primary settling tanks. Sludge from the storage is sent to the composting facility and is also used for land application	

I. Description of Facility, Outfall and Receiving Stream

<u>Details for Outfall:</u>			
Outfall Type: Non-submerged discharge <input type="checkbox"/> Pipe <input type="checkbox"/> Ditch <input type="checkbox"/> Distance from the last sampling point: _____ Submerged Discharge: <input checked="" type="checkbox"/> Distance from the last sampling point: _____, Diameter of the Outfall Pipe: <u>N/A</u> Distance from Shore: <u>1,158 ft</u> , Depth: <u>0.71 ft below surface</u> , No. of Diffusers _____			
Outfall 001A Location:	GPS Readings		Maryland Coordinates (NAD27), feet
	Latitude 39° 17' 38" (N)	Longitude 76° 28' 28" (W)	North 532,341 East 948,7469

Details for Effluent Receiving Stream

Name of Stream	Back River which flows into the Chesapeake Bay.
Type of Stream	Perennial
Stream Use Designation	Back River is designated as Use II waters Middle Chesapeake Bay is designated as II waters
River Mile	6.3 Miles from the outfall 001 to the confluence of the Back River with the Chesapeake Bay
Watershed	8-Digit Sub-watershed Code: 02-13-09-01 CBPSEG Code: BACOH- Back River Oligohaline Back River drains into Middle Chesapeake Bay (Segment 02-13-99-97)
Tier II Waters	Receiving stream(s) designated as Tier II water Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Tier II rules applicable to discharge Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Does the facility discharge into impaired waters included on (303(d) list)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> As per the approved Integrated Report of Surface Water Quality (formerly known as the 303(d) List and 305(b) Report), the streams in the Back River sub-watershed are listed as impaired water bodies due to PCBs in both, sediment (1998) and fish tissue (2008), sediments (1996), chlordane (1996), nitrogen and phosphorus (1996), chlorides (2012), and sulfates (2012).

I. Description of Facility, Outfall and Receiving Stream

Approved Total Maximum Daily Load (TMDL) / Water Quality Analysis (WQA) for concerned parameter(s)	<p>Any approved TMDL(s) / WQA(s) for 02-13-09-01 watershed Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Following TMDLs were approved by the EPA:</p> <p>Nutrients TMDLs for Back River - approved on June 29, 2005</p> <p>PCBs TMDL for Back River - approved on October 1, 2012</p> <p>Chlordane TMDL for Back River - approved on December 17, 1999</p> <p>Zinc WQA for Back River – approved on December 23, 2004</p> <p>E.coli TMDL for Herring Run - approved on December 4, 2007</p> <p>Nutrients TMDLs for Baltimore Harbor - approved on December 17, 2007 and revised on October 13, 2015</p> <p>PCBs TMDL for Baltimore Harbor - approved on October 1, 2012</p> <p>Chesapeake Bay TMDL for Total Nitrogen, Total Phosphorus and Total Suspended Solids – approved on December 29, 2010</p>																			
Background Stream Flows (See PROJECT FILE for details):	<table border="1"> <tr> <th>Period</th> <th>7Q10 Low-flow, cfs</th> <th>30Q5 Low-flow, cfs</th> <th>Average Flow, cfs</th> </tr> <tr> <td>5/1 To 10/31</td> <td>2.5</td> <td>3.8</td> <td>N/A</td> </tr> <tr> <td>11/1 To 4/30</td> <td>2.5</td> <td>3.8</td> <td>N/A</td> </tr> <tr> <td>Annual</td> <td>2.5</td> <td>3.8</td> <td>N/A</td> </tr> </table>				Period	7Q10 Low-flow, cfs	30Q5 Low-flow, cfs	Average Flow, cfs	5/1 To 10/31	2.5	3.8	N/A	11/1 To 4/30	2.5	3.8	N/A	Annual	2.5	3.8	N/A
Period	7Q10 Low-flow, cfs	30Q5 Low-flow, cfs	Average Flow, cfs																	
5/1 To 10/31	2.5	3.8	N/A																	
11/1 To 4/30	2.5	3.8	N/A																	
Annual	2.5	3.8	N/A																	

I. Description of Facility, Outfall and Receiving Stream**Plant Performance Evaluation:**Source of Data: ICIS, Data Period: 7/1/11 thru 7/31/2016

The plant performance for discharge from Back River WWTP Outfall 001A is summarized as follows:

Parameter	Concentration	Quantity
BOD ₅	3.7 mg/l	3,293 lbs/day
Total Suspended Solids (TSS)	3.8 mg/l	3,382 lbs/day
Total Ammonia Nitrogen as N (5/1 to 10/31) (2012-2015) (11/1 to 4/30)	0.28 mg/l 2.0 mg/l	240.4 lbs/day 1834 lbs/day
Organic Nitrogen as N	1.7 mg/l	1,513 lbs/day
(Nitrite + Nitrate) as N	5.8 mg/l	5,161 lbs/day
Total Nitrogen as N (1/1-12/31) Total Nitrogen as N (5/1-10/31)	8.1 mg/l	2,630,924 lbs/yr 207,657 lbs/month (5/1-10/31)
Total Phosphorus as P (1/1-12/31) Total Phosphorus as P (5/1-10/31) Total Phosphorus as P (1/1-12/31)	0.17 mg/l	151lbs/day 4,390 lbs/month (5/1-10/31) 55,217 lbs/yr
E. Coli	10.7 MPN/100ml	N/A
Total Residual Chlorine (TRC)	0.1 mg/l	N/A
pH	6.7 minimum 7.4 maximum	N/A N/A
Dissolved Oxygen (DO)	8.5 mg/l	N/A
Flow (1/1-12/31) Flow (5/1-10/31) Flow (11/1-4/30)	Outfall 001A: 106.7 103.7 109.8	Outfall 002A 38.4 36.4 40.4 MGD MGD MGD

II. Special Requirements and Conditions

WWTP meeting at least 85% reduction of BOD₅ and TSS Yes ☒ No ☐ N/A ☐

Based on the plant performance records for 7/1/2011 thru 7/31/2016, the effluent BOD₅ and TSS are averaged 3.7mg/l and 3.8 mg/l, respectively. Using BOD₅ and TSS concentration of 200 mg/l for typical raw-sewage influent (as stated in the technical manuals), this facility removes more than 98 % of BOD₅ and TSS during the treatment processes, far exceeding the minimum 85% removal requirement for POTWs with the secondary treatment.

Rationale: 40CFR, PART 133, §133.102

Enhanced Nutrient Removal (ENR) Requirements: ENR Limits ☒ ENR Goal ☐ N/A ☐

Back River WWTP has been assigned with the following requirements:

For 130.0 mgd flow thru Outfall 001A to Back River, per Back River TMDL:

Total Nitrogen = 99,782 lbs/month (5/1-10/31) and 1,582,055 lbs/year*

Total Phosphorus = 6,652 lbs/month (5/1-10/31) and 79,277 lbs/yr*

For 50.0 mgd flow thru Outfall 002A to Baltimore Harbor, per Chesapeake Bay TMDL:

Total Nitrogen = 230,294 lbs/season (5/1-10/31) and 610,748 lbs/year*

Total Phosphorus = 15,353 lbs/season (5/1-10/31) and 30,363 lbs/yr*

* Upon completion of the ENR upgrade and per Chesapeake Bay model waste load allocation, the discharge from the Back River WWTP shall meet an annual load limit of 2,192,800 lbs/yr for total nitrogen, 109,600 lbs/yr for total phosphorus and 8,548,254 lbs/yr of total suspended solids for the flows from the Outfalls 001A and 002A combined together. The sum of flows from outfall 001A and outfall 002A is limited to 180.0 mgd. Since Back River TMDL allocated TN load of 1,582,055 lbs/yr and TP load of 79,277 lbs/yr for discharge into the Back River, the remaining loads are allocated to the outfall 002A thru Industrial Outfalls discharging into Bear Creek.

This is an ENR significant WWTP with a design capacity of greater than 0.5 MGD discharging into the Chesapeake Bay Water Quality Segment- BACOH_MD (Back River Oligohaline_Maryland). As per the current Departmental Guidelines for the ENR requirements, the above stated WLAs for TN and TP are incorporated to establish the seasonal and annual maximum load limits for the proposed permit renewal.

Rationale: Maryland's Chesapeake Bay Tributary Strategy Statewide Implementation Plan, 2008 and Chesapeake Bay Watershed Implementation Plan

II. Special Requirements and Conditions**TMDL Implementation Requirements:**Yes ☒ No ☐ N/A ☐

As per the Back River TMDL, Back River WWTP has been assigned with the following Waste Load Allocations (WLAs):

For Outfall 001A to Back River, per Back River TMDL for 130.00 MGD flow:

Total Nitrogen = 99,782 lbs/month (5/1-10/31) and 1,582,055 lbs/year*

Total Phosphorus = 6,652 lbs/month (5/1-10/31) and 79,277 lbs/year*

Total Suspended Solids = 3,959,228 lbs/yr*

tPCB = 48.5 g/yr

For Outfall 002A to Baltimore Harbor per Chesapeake Bay TMDL:

Total Nitrogen = 217,600 lbs/year*

Total Phosphorus = 60,880 lbs/year*

Total Suspended Solids = 4,589,026 lbs/yr*

tPCB = 18.66 g/yr

Total Suspended Solids = 8,548,254 lbs/year (For Outfalls 001A and 002A combined together)

* Upon completion of the ENR upgrade and per Chesapeake Bay model waste load allocation, the discharge from the Back River WWTP shall meet an annual load limit of 2,192,800 lbs/year for total nitrogen, 109,600 lbs/year for total phosphorus and 8,548,254 lbs/year of total suspended solids for the flows of 180.0 mgd from the Outfalls 001A and 002A combined together. Since Back River TMDL allocated TN load of 1,582,055 lbs/year, TP load of 79,277 lbs/year and the Chesapeake Bay model allocated TSS load of 3,959,228 lbs/yr lbs/year, to the outfall 001A, the remaining loads are allocated to Outfall 002A thru the Industrial Outfalls discharging into Bear Creek.

Rationale: 40 CFR §130.7, The approved TMDL(s) of {PARAMETER} for {STREAM / WATERSHED}.

Was WET testing required in the previous discharge permit (10-DP-0581)?

Yes ☒ No ☐ N/A ☐

Make appropriate changes to the contents of the following table to summarize the results of the WET tests.

TEST PERIOD	TEST SPECIES	TEST RESULTS	
		48-hour LC ₅₀ (ACUTE)	IC ₂₅ (CHRONIC)
Jan 30, 2012	C. dubia		
	P. promelas	>100	<100 (37.6)
May 7, 2012	C. dubia	>100	>100
	P. promelas	>100	>100
Aug 7, 2012	C. dubia	>100	>100
	P. promelas	>100	>100
Dec 10, 2012	C. dubia	>100	>100
	P. promelas	>100	>100
Feb 4, 2013	C. dubia	>100	>100
	P. promelas	>100	<100 (81.6)
May 6, 2013	C. dubia	>100	>100
	P. promelas	>100	>100

II. Special Requirements and Conditions

TEST PERIOD	TEST SPECIES	TEST RESULTS	
		48-hour LC ₅₀ (ACUTE)	IC ₂₅ (CHRONIC)
Aug 5, 2013	C. dubia	>100	>100
	P. promelas	>100	>100
Nov 4, 2013	C. dubia	>100	>100
	P. promelas	>100	>100
May 4, 2014	C. dubia	>100	>100
	P. promelas	>100	>100
Aug 3, 2014	C. dubia	>100	>100
	P. promelas	>100	>100
Nov 16, 2014	C. dubia	>100	<100
	P. promelas	>100	>100
May 4, 2015	C. dubia	>100	>100
	P. promelas	>100	>100
Nov 18, 2015	C. dubia		
	P. promelas	>100	>100
Feb 8, 2016	C. dubia		
	P. promelas	>100	>100
May 9, 2016	C. dubia		
	P. promelas	>100	>100

Results of the one per quarter for Whole Effluent Toxicity (WET) sampling during January 30, 2012 thru May 9, 2016 were reviewed. The Back River WWTP effluent failed the January 30, 2012 chronic toxicity test (IC₂₅ was 37.5) and the February 4, 2013 chronic toxicity test (IC₂₅ was 81.6) (see pages 133 thru 141). Even though, the results of all the WET tests from May 6, 2013 thru May 9, 2016 were >100, the current WET permit limits of TU_a < 1.00 and TU_c < 1.02 and testing frequency of one/quarter is proposed for the renewal permit.

Are WET limits proposed for the permit?

Yes ☒ No ☐ N/A ☐

The Back River WWTP does have a history of intermittent whole effluent toxicity (WET) (failed two chronic tests (Jan'2012 and Feb'2013) out of 15 tests). Based on the most recent WET tests results (listed on pages - 8 and 9) it is recommended to continue with the WET limits in the renewal discharge permit.

Rationale: COMAR 26.08.03.07D(1,) COMAR 26.08.03.07E and MDE's "Effluent Biototoxicity Testing Protocol, revised on 12/14/2012".

II. Special Requirements and Conditions**Is WET testing proposed for the permit?**Yes ☒ No ☐ N/A ☐

Biological testing for the whole effluent toxicity determination is required for POTWs with (a) flows equal to or greater than 1.0 mgd or an approved pretreatment program, (b) a discharger that has demonstrated actual or potential toxicity, or (c) a discharger whose discharge the Department believes may cause toxicity as determined by an evaluation of manufacturing processes, indirect discharges, treatment processes, effluent or receiving water data, or other relevant information..

Estimation of Instream Waste Concentration (IWC) for WET:**For Discharge to Tidal (Estuarine) waters (Submerged Outfall):**

$$IWC(\%) = \left[\frac{130.0 \times 1.5472}{(130.0 \times 1.5472) + 3.8} \right] \times 100 = \underline{98.2\%}$$

$$Q_{RWE} = \left[\frac{(1 - 0.982)}{0.982} \right] \times 130.0 \times 1.5472 = \underline{3.8\text{cfs}}$$

Where, Q_D = Plant permitted flow = 130.0 MGD Q_{RWE} = Calculated equivalent annual 30Q5 low-flow = 3.8 cfs F = Chronic Toxicity Dilution factor = 0.982**Was Toxic Chemical Testing required
in the previous discharge permit (10-DP-0581)?**Yes ☒ No ☐ N/A ☐

Total three effluent toxic chemical tests were performed during the permit cycle. with added monitoring for chlordane, endrin and PCB. All of the available data for toxics have been reviewed and incorporated to determine local limits for the priority pollutants using the SPREADSHEET program for evaluating reasonable potential to violate State Toxic Substances Criteria. The analysis results show that no reasonable potential is existed for violations of Criteria, except for tPCBs, chromium (Hex) and free cyanide; and hence, additional monitoring for these parameters is needed beyond the routine four toxic chemical testing requirements for this facility.

II. Special Requirements and Conditions

Is Toxic Chemical Testing (TCT) proposed?

Yes ☒ No ☐ N/A ☐

TCT is required for POTWs with (a) flows equal to or greater than 1.0 mgd or an approved pretreatment program, (b) a discharger that has demonstrated actual or potential toxicity, or (c) a discharger whose discharge the Department believes may cause toxicity as determined by an evaluation of manufacturing processes, indirect discharges, treatment processes, effluent or receiving water data, or other relevant information. The TCTs for this facility are proposed as follows: Concurrent with each first biomonitoring toxicity test (Special Condition II.D.2 of the discharge permit), during the first four years of the permit cycle, the permittee shall perform analytical testing for the toxic chemicals.

Rationale: COMAR 26.08.03.07D(1) and MDE's "Toxic Pollutant Analytical and Reporting Requirements Protocol, revised on 5/18/2011"

Wastewater Capacity Management

Does the proposed permit include condition pertaining to the wastewater flow capacity management?

Yes ☒ No ☐

If Yes, does the proposed permit require submittal of Capacity Management Plan (CMP)?

Yes ☒ No ☐

Because the most recent three-year annual average wastewater flow is 80.6 % of the existing rated capacity of 180.0 MGD which exceeds a threshold of 80% capacity.

Rationale: MDE's Guidance Document "Wastewater Capacity Management Plans, 2006"

Pretreatment Program/Influent Restriction

WWTP with approved pretreatment program ☒ Non-pretreatment program WWTP ☐

Does the non-pretreatment WWTP require the influent restriction? Yes ☐ No ☐

Rationale: COMAR 26.08.08 and Department Guidelines

Reapplication Due Date for Next Permit Renewal

Per the Departmental guidelines for the watershed permitting, the next renewal of a discharge permit for Back River WWTP is scheduled for 1st quarter, 3rd year in cycle with the projected renewal application received date of 1/1/2021 and reissuance date of 4/1/2022.

The issuance date of this proposed permit will be established after fulfilling all the formalities of the public participation process. It is anticipated that a period between the proposed permit issuance date and the above stated reapplication date for the next permit cycle year would likely exceed the minimum permit processing period of 42 months; and therefore, the reapplication due date will be set to no later than 18 months before the expiration date of the proposed permit.

Rationale: COMAR 26.08.04.01 and Departmental Guidelines.

II. Special Requirements and Conditions

Are temperature requirements included?Yes ☐ No ☒

For Use II waters:

The Department recognizes that WWTP effluent may involve a thermal component. For this discharge, there is no reasonable potential for the temperature to exceed the 90° F or the ambient temperature of the surface waters criteria in COMAR 26.08.02.03-3; therefore, temperature limitations and monitoring are not required.

Rationale: COMAR 26.08.02.03-3

Does the WWTP use lagoon(s) for wastewater treatment?Yes ☐ No ☒

If yes,

The permit does not authorize the permittee to discharge any type or quantity of the wastewater to the groundwater of the State. The permittee must make every effort to prevent any type of leakage or discharges to the groundwater system from the wastewater treatment lagoon(s) and/or other conveyance system.

The permittee may not abandon the existing wastewater treatment lagoon (pond) system in as-is condition. If the permittee plans to eliminate the lagoon system, either through replacement with a new treatment process or closure, the permittee shall submit to the Department a "Decommissioning and a Relining Plan" (the Plan) in advance, including the removal and utilization of sewage sludge, proper demolition, capping, and disposal of any treatment components installed or utilized at the site, and abandonment of any onsite groundwater monitoring wells. The Plan must state that the permittee may not accept or introduce any other material to the lagoon system including wastewater, septage, or sewage sludge, or any industrial wastewater, without a specific authorization from the Department. Utilization of the sewage sludge removed from the facility's pond system must comply with requirements in the Code of Maryland Regulations (COMAR) 26.04.06 for Sewage Sludge Management..

Rationale: Department Policy.

Is the emergency holding pond required?Yes ☐ No ☒*Rationale:* COMAR 26.08.04.04C(2)(c)

III. Proposed Effluent Limits and Monitoring Requirements

The effluent limits and monitoring requirements, as listed below, are proposed to process the application for the discharge permit renewal. *Refer to Appendix- A for the previous permit's effluent limitations and monitoring requirements.*

The quality of the effluent discharged by the facility at the discharge location- (001A and 002A)⁽¹⁾⁽²⁾⁽³⁾ shall be limited and/or monitored at all times as shown below. If the sampling point is other than the outfall- 001A, the permittee shall ensure that the effluent samples are representative of the effluent quality being discharged at the outfall 001A.

Effluent Characteristics	Requirements	Period	Quantity	Concentration	Footnotes
BOD₅	Limits for Outfall 001A	1/1-12/31	11,000 lbs/d (mo ave) 16,000 lbs/d (wkly ave)	10 mg/l (mo ave) 15 mg/l (wkly ave)	N/A
	Limits for Outfall 002A	5/1-10/31	17,000 lbs/d (mo ave) 25,000 lbs/d (wkly ave)	20 mg/l (mo ave) 30 mg/l (wkly ave)	
		11/1-4/30	25,000 lbs/d (mo ave) 38,000 lbs/d (wkly ave)	30 mg/l (mo ave) 45 mg/l (wkly ave)	
	Monitoring	1/1-12/31	Frequency One per day	Sample Type 24-hour composite	(10)
Total Suspended Solids (TSS)	Limits for Outfall 001A	1/1-12/31	11,000 lbs/d (mo ave) 16,000 lbs/d (wkly ave) 3,959,228 lbs/yr (annual max)	10 mg/l (mo ave) 15 mg/l (wkly ave)	N/A
	Limits for Outfall 002A	1/1-12/31	25,000 lbs/d (mo ave) 38,000 lbs/d (wkly ave) 4,589,022 (annual max)	30 mg/l (mo ave) 45 mg/l (wkly ave)	
	Monitoring	1/1-12/31	Frequency One per day	Sample Type 24-hour composite	(10)
Total Ammonia Nitrogen as N	Limits for Outfall 001A	5/1-10/31	2,200 lbs/d (mo ave) 3,300 lbs/d (wkly ave)	2.0 mg/l (mo ave) 3.0 mg/l (wkly ave)	
		11/1-4/30	5,529 lbs/d (mo ave) N/A (wkly ave)	5.1 mg/l (mo ave) N/A (wkly ave)	
	Limits for Outfall 002A	5/1-10/31	1,700 lbs/d (mo ave) 2,500 lbs/d (wkly ave)	2.0 mg/l (mo ave) 3.0 mg/l (wkly ave)	
		11/1-4/30	4,253 lbs/d (mo ave) N/A (wkly ave)	5.1 mg/l (mo ave) N/A (wkly ave)	
	Monitoring	All Year	Frequency One per day	Sample Type 24-hour composite	(10)(12)
Organic Nitrogen as N (Monitoring only parameter)	Reporting	All Year	N/A	REPORT mg/l (mo ave)	(10)(11)(12)
	Monitoring		Frequency One per day	Sample Type 24-hour composite	

III. Proposed Effluent Limits and Monitoring Requirements

(Nitrite + Nitrate) as N (Monitoring only parameter)	Reporting	1/1-12/31	N/A	REPORT mg/l (mo ave)	(10)(11)(12)
	Monitoring		Frequency One per day	Sample Type 24-hour composite	
Total Nitrogen as N	Limits for Outfall 001A	5/1-10/31	99,782 lbs/mo (monthly load)	REPORT mg/l (mo ave)	(4)(5)(6)(7)
		1/1-12/31	1,582,055 lbs/yr (annual max)		
	Limits for Outfall 002A	5/1-10/31	230,294 lbs/se (seasonal load)		
		1/1-12/31	610,748 lbs/yr (annual max)		
	Monitoring	All Year	Frequency One per day	Sample Type Calculated	(10)(12)(13)
Orthophosphate as P (Monitoring only parameter)	Reporting	1/1-12/31	N/A	REPORT mg/l (mo ave)	(10)(11)
	Monitoring		Frequency One per week	Sample Type 24-hour composite	
Total Phosphorus as P	Limits for Outfall 001A	1/1-12/31	220 lbs/d (mo ave) 330 lbs/d (wkly ave)	0.2 mg/l (mo ave) 0.3 mg/l (wkly ave)	(4)(5)(6)(7)
		5/1-10/31	6,652 lbs/mo (monthly load)	REPORT mg/l (mo ave)	
		1/1-12/31	79,277 lbs/yr (annual max)		
	Limits for Outfall 002A	1/1-12/31	170 lbs/d (mo ave) 250 lbs/d (wkly ave)	0.2 mg/l (mo ave) 0.3 mg/l (wkly ave)	
		5/1-10/31	15,353 lbs/se (seasonal load)	REPORT mg/l (mo ave)	
		1/1-12/31	30,363 lbs/yr (annual max)		
	Monitoring	1/1-12/31	Frequency One per day	Sample Type 24-hour composite	(10)(13)
E. Coli	Limits	1/1-12/31	N/A	126 MPN/100 ml (max mo geo mean)	
	Monitoring	1/1-12/31	Frequency One per day	Sample Type Grab	(10)
Total Residual Chlorine (TRC)	Limits for 001A	1/1-12/31	N/A	0.011 mg/l (See footnote- 8)	(8)
	Monitoring	1/1-12/31	Frequency Three per day, one per shift	Sample Type Grab	(10)(14)(15)
pH	Limits	1/1-12/31	N/A	6.5 SU min 8.5 SU max	
	Monitoring	1/1-12/31	Frequency Three per day, one per shift	Sample Type Grab	(10)(15)

III. Proposed Effluent Limits and Monitoring Requirements

Dissolved Oxygen (DO)	Limits	1/1-12/31 2/1 – 5/31	N/A N/A	5.0 mg/l (min at anytime) 6.0 mg/l (min wkly ave)	N/A
	Monitoring	TBD	Frequency Three per day, one per shift	Sample Type Grab	(10)(15)
Cyanide (Free)	Limits	All Year	REPORT	REPORT mg/l (mo ave)	(10)(11)(16)
	Monitoring	All Year	Frequency One per month	Sample Type Grab	
Total Polychlorinated Biphenyls (tPCBs)	Limits	All Year	REPORT	REPORT pg/l (qu ave)	(10)(11)(16)
	Monitoring	All Year	Frequency One per Quarter	Sample Type 24-hour composite	
Whole Effluent Toxicity (WET) Acute and Chronic	Limits	All Year	N/A N/A	TU _a < 1.00 TU _c < 1.02	(9)(10)(17)
	Monitoring	All Year	Frequency One per Quarter	Sample Type 24-hour composite	
Flow	Limits / Reporting	All Year	REPORT mgd (mo ave) REPORT mgd (daily max)	N/A	N/A
	Monitoring	All Year	Frequency Continuous	Sample Type Recorded	(10)(18)(19)
Total Flow	Reporting	All Year	REPORT Mgal/MO (Monthly Total)	N/A	(10)(20)
	Monitoring	All Year	Frequency Monthly	Sample Type Calculated	

An annual average flow of 130.0 mgd for outfall 001A and 100 mgd for outfall 002A was used in waste allocation calculations (expressed as waste loading rate limit), and this (mgd) million gallons per day unit shall be used when reporting on the Discharge Monitoring Report (DMR), (EPA Form 3320-1, Rev. 01/06). Notification is to be provided to the Department at least 180 days before the annual average flow is expected to exceed this flow level or when the sum of flows from outfall 001A and 002A combined together is expected to exceed 180.0 mgd. The facility shall meet an annual load limit of 2,192,800 lbs/yr for total nitrogen, 109,600 lbs/yr for total phosphorus and 8,548,254 lbs/yr for total suspended solids for flows from outfall 001A and 002A combined together. The ENR limits included in the permit go into effect on the effective date of this permit.

Footnotes:*For Effluent Limitations*

- (1) When this permit is renewed, the new limitations may not be equal to the above limitations.
- (2) There shall be no discharge of floating solids or visible foam other than trace amounts.

III. Proposed Effluent Limits and Monitoring Requirements

Footnotes:

For Effluent Limitations, continued

⁽³⁾ The permit may also be reopened in accordance with the requirements of MDE's Watershed Permitting Plan under which all discharge permits in a watershed are issued the same year.

⁽⁴⁾ ^(a) The Back River (basin number 02130901) is on the 303(d) list as the impaired waters for PCBs in both, sediment (1998) and fish tissue (2008), sediments (1996), chlordane (1996), nitrogen and phosphorus (1996), chlorides (2012), and sulfates (2012). As per the Back River TMDL, Back River WWTP has been assigned with the following Waste Load Allocations (WLAs):

For Outfall 001A to Back River, per Back River TMDL for 130.00 MGD flow:

Total Nitrogen = 99,782 lbs/month (5/1-10/31) and 1,582,055 lbs/year*

Total Phosphorus = 6,652 lbs/month (5/1-10/31) and 79,277 lbs/year*

tPCB = 48.5 g/year

For 50.0 mgd flow thru Outfall 002A to Baltimore Harbor per Chesapeake Bay TMDL:

Total Nitrogen = 230,294 lbs/ season (5/1-10/31) and 610,748 lbs/year*

Total Phosphorus = 15,353 lbs/season (5/1-10/31) and 30,363 lbs/year*

tPCB = 18.66 g/year

* The facility shall meet an annual load limit of 2,192,800 lbs/yr for total nitrogen, 109,600 lbs/yr for total phosphorus and 8,548,254 lbs/yr for total suspended solids for flows from outfall 001A and 002A combined together. The ENR limits go into effect on the effective date of this permit.

Chlordane, E. Coli and Zinc = No WLA was made to the Back River WWTP.

This permit is in conformance with the "Chesapeake Bay TMDL for Nitrogen, Phosphorus and Sediment" established on December 29, 2010. When TMDLs for other remaining parameters are completed, limits may be imposed, after the public participation process, to incorporate any TMDL requirements. Until the facility's ENR upgrade to the treatment is complete and fully operational, the permittee is to operate the Biological Nutrient Removal (BNR) process on a year round basis. Total Nitrogen is the sum of ammonia-N, organic-N and (nitrite + nitrate)-N based on samples collected on the same day.

⁽⁴⁾ ^(b) The TMDL for PCBs for Back River approved by the EPA on 10/1/2012, has included a tPCBs annual waste load allocation (WLA) of 48.5 grams/year (0.107 pounds/year) for Outfall 001A (that is based on the design flow of 130.0 mgd and the water column TMDL endpoint tPCBs concentration of 0.27 nanograms per liter (ng/l)).

⁽⁴⁾ ^(c) The TMDL for the Baltimore Harbor approved by the EPA on 10/1/2012, included a tPCBs WLA of 18.66 g/year (0.0411 pound/year) for the Back River WWTP Outfall 002A (that is based on the design flow of 50.0 mgd and the water column TMDL endpoint tPCBs concentration of 0.27 nanograms per liter (ng/l)).

The above stated WLAs of tPCBs included in the TMDL does not impose effluent limits for tPCBs in the discharge permit until the effluent tPCBs data collected after the completion of the ENR upgrade are evaluated by the Department. Upon completion of the ENR upgrade, if the facility's annual tPCBs load exceeds the WLA, the permittee shall submit a plan to the Department for approval to track the sources and Best Management Practice (BMP) implementation within 180 days of exceedence of the above stated annual load for tPCBs.

⁽⁵⁾ The permittee shall operate the ENR facility in a manner that optimizes the nutrient removal capability of

III. Proposed Effluent Limits and Monitoring Requirements

- (5) The permittee shall operate the ENR facility in a manner that optimizes the nutrient removal capability of the facility as stipulated in the Grant Agreement for ENR upgrade. The first exceedance of the permit limit shall be counted and reported as daily exceedances beginning from the first exceedance, determined to the nearest day, through December 31. In addition, after any such exceedance, the permittee shall demonstrate to the Department's satisfaction that the facility is optimizing its nutrient removal capability, and neither the arrival of the next calendar year nor the issuance of a permit renewal during a period of noncompliance shall obviate continuance of any noncompliance status related to treatment optimization requirements.
- (6) At the end of each calendar year, the permittee shall comply with the *concentration-based* limitations for the Annual Maximum Loading Rate defined below or the *Tributary Strategy-based* loading rate limitation listed in above in the effluent limitations table, whichever is lower:
- (a) TN Limitation (lbs/year): $4.0 \text{ mg/l} \times \text{annual total flow (calendar year based in million gallons per year)} \times 8.34$. To the extent that the permittee alleges that temperature levels of 12 degrees C or lower have diminished the treatment system's capability of complying with this *concentration-based* loading rate limitation for Total Nitrogen, the permittee shall provide notification beginning with the calendar year report under the "Upset" provision in Section III.B.6 of this permit. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.
- (b) TP Limitation (lbs/year): $0.20 \text{ mg/l} \times \text{annual total flow (calendar year based in million gallons per year)} \times 8.34$.

The details and results of all required annual calculations shall be submitted to the Department with the Discharge Monitoring Report for December. See Special Condition II.O of the draft permit for further details. The *concentration-based* loading requirements may be revised if the limits or schedule are determined to be impracticable based on actual performance and the Department re-opens the permit as a major modification (which requires public participation) to impose (an) alternate effluent limitation(s) or revised schedule.

- (7) The permittee may request that the permit be reopened and modified to include nutrient trading consistent with the most current "Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed" in effect at that time.
- (8) Total residual chlorine limitation of 0.011 mg/l shall be applicable, when chlorine or any chlorine-containing compound is used in any treatment process(es), including but not limited to disinfection, that could become a potential constituent of the effluent discharged from the Back River WWTP. The wastewater shall be dechlorinated to reduce effluent total residual chlorine concentration to the nondetectable level (See definition I.L of the draft permit).
- (9) TU_a is defined as 100 divided by the LC₅₀ value resulting from the first 48 hours of a valid acute or chronic toxicity test. Compliance with the LC₅₀ requirements shall be determined through testing performed in accordance with Special Condition II.D. TU_c is defined as 100 divided by the IC₂₅ value resulting from a valid chronic toxicity test. Compliance with the IC₂₅ requirements shall be determined through testing performed in accordance with Special Condition II.D.

For Monitoring Requirements

- (10) "STORET" (short for STORage and RETrieval) is a widely-used repository for water quality data reporting and monitoring. The corresponding STORET codes for the effluent characteristics specified in Special Conditions II.A and II.B are: BOD₅ (00310), Total Suspended Solids (00530), Total Ammonia Nitrogen as N (00610), Total Phosphorus as P (00665), Total Nitrogen as N (00600), (Nitrite + Nitrate) as N (00630), Organic Nitrogen as N (00605), Orthophosphate as P (04175), E. Coli (51040), Total Residual Chlorine (50060), Dissolved Oxygen (00300), pH (00400), Flow (50050), Total monthly flow (82220), Total hardness as CaCO₃, (00900), tPCBs (79819), WET Acute Toxicity (TS000), WET Chronic Toxicity (TT000), Chromium (hex)(78247), and Cyanide (free)(00722).

III. Proposed Effluent Limits and Monitoring Requirements

- (11) This parameter (without effluent limitations) must be monitored, and it shall be reported on the Monthly Operating Report (MOR) as individual results and on the Discharge Monitoring Report (DMR) as monthly average concentrations.
- (12) Total nitrogen as N (in mg/l) is a calculated parameter as the sum of individual results for total ammonia nitrogen as N, organic nitrogen as N and (nitrite + nitrate) as N. All the nitrogen species must be sampled on the same day.
- (13) The permittee shall also calculate and report on the monthly DMR the TN and TP total monthly loads plus year-to-date cumulative loads for the calendar year in question for the outfall- 001A and 002A.
- For each calendar year, the year-to-date cumulative loads of TN and TP for the month of December shall represent the total annual loads, and they must be incorporated toward complying with the respective annual maximum load limits.. Refer to Special Condition II.K of the permit for "Reporting TN and TP total annual loads for compliance to the Concentration-based maximum annual loading rate limits".
- (14) The Minimum monitoring requirements of three per day-grab samplings for total residual chlorine shall be applicable, when chlorine or any chlorine compound is used in any treatment process(es), including but not limited to disinfection, that could become a potential constituent of the effluent discharged from the Back River WWTP. The minimum detection level (quantification level) for total residual chlorine is 0.10 mg/l. The permittee may report all results below the minimum level as <0.10 mg/l. All results reported below the minimum level shall be considered in compliance.
- (15) Samples for these parameters (total residual chlorine, pH and dissolved oxygen) shall be taken at intervals evenly distributed throughout the staffed period each day to comply with the General Condition III.A for the representative sampling requirements.
- (16) All toxic chemical monitoring required by this permit shall be performed in accordance with MDE's Water Management Administration Toxic Substance Analytical Protocol. This includes analytical methodology, detection levels, holding times, preservation methods, sample types and reporting.
- The permittee shall measure and report tPCBs in picograms/L. To incorporate the TMDL of PCBs for Back River approved by the EPA on 10/1/2012, the effluent tPCBs monitoring and annual totals PCBs reporting shall be initiated upon completion and beginning operation of the ENR upgrades at Back River WWTP. The permittee shall use the approved EPA testing Methods in accordance with MDE's protocol titled "Reporting Requirements for Total PCBs (PCB Congeners) by EPA Method 1668 C or A". The tPCBs monitoring shall be once per quarter for at least one year beginning the ENR operation. The quarter shall end on March, June, September and December.
- The annual average concentration for tPCBs shall be calculated using the following formula:
- $$\text{Average Concentration (pg/l)} = 264172 \times \frac{\text{Total Annual Cumulative load discharged (Grams)}}{\text{Total Annual Flow (MG) at 001A and 001B}}$$
- Based on the tPCBs monitoring results, the Department will determine whether to continue tPCBs monitoring or change the tPCBs monitoring frequency after the tPCBs sources are identified and eliminated through BMP as stated in footnote 4_(b). Any changes to the effluent tPCBs limits and/or monitoring requirements shall be addressed through the permit modification process.
- (17) Whole Effluent Toxicity (WET) samples shall be collected quarterly, analyzed, and reported in accordance with the MDE Water Management Administration's "Effluent Biototoxicity Testing Protocol for Industrial and Municipal Effluents" and Special Condition II.D.
- (18) Flows shall be reported in millions gallons per day (mgd) to at least the nearest 10,000 gallons per day. (Example: A flow of 1,524,699 gallons per day shall be reported as 1.53 mgd.). For each calendar month, flows shall be reported on the MOR as daily individual results and on the DMR as monthly average (mgd) and daily maximum (mgd)).

III. Proposed Effluent Limits and Monitoring Requirements

- (19) Continuous electronic flow measurement and recording which can produce a permanent record are acceptable to the Department.
- (20) Total monthly flow is a calculated parameter equal to sum of the daily flow results in a calendar month. It shall be reported on the monthly DMR as Total monthly flow in millions gallons (MG) to at least the nearest 10,000 gallons. (Example: A flow of 1,524,699 gallons shall be reported as 1.53 MG).

Regulations and Rationale for Effluent Limitations:

BOD₅	<p><u>Regulations:</u> 40 CFR §130.7, COMAR 26.08.02.03-3A(2), COMAR 26.08.04.04C(1) and COMAR 26.08.01.01B(80).</p> <p><u>Discussion and Rationale(s):</u> The technical analysis was performed by Science Services Administration (SSA) in July 1995 using a mathematical model (WASP) to establish the effluent limits requirements for discharge flows up to 130.0 MGD. There is no increase of the discharge flow for the permit renewal; and also, there are no indications of apparent changes to the receiving stream. Therefore, the BOD₅ and dissolved oxygen effluent limits established in 1995 and incorporated in previous permit 10-DP-0581 have been considered at this time for the proposed permit renewal. These limits will be protective of meeting the dissolved oxygen criteria in downstream portion of the effluent receiving stream(s).</p>
Total Suspended Solids (TSS)	<p><u>Regulations:</u> 40 CFR §130.7, COMAR 26.08.02.03-3A(5), COMAR 26.08.04.04C(1), COMAR 26.08.01.01B(80) and 40 CFR §133.102 - §133.105.</p> <p><u>Discussion and Rationale(s):</u> Under the Chesapeake Bay Watershed Implementation Plan as adopted in the Chesapeake Bay TMDL, all the significant point sources (WWTPs) discharging into the Chesapeake Bay watershed have been assigned with the individual WLA for TSS. The proposed TSS limits are in conformance to the requirements of the Chesapeake Bay TMDL as accepted by EPA on 12/29/2010.</p>
Total Ammonia Nitrogen as N	<p><u>Regulations:</u> COMAR 26.08.02.03-2J, COMAR 26.08.02.03-2K and COMAR 26.08.02.05C, COMAR 26.08.02.05D.</p> <p><u>Discussion and Rationale(s):</u> The reasonable potential of the Back River WWTP effluent to cause a violation of the receiving stream's ammonia water quality criteria was investigated to process the discharge permit renewal. An in-house SPREADSHEET program (developed by the Municipal Surface Discharge Permits Division) was used as a tool for the toxicity analysis. The dilution factors, based on the applicable mixing zone criteria, were incorporated in the analysis. As the ammonia toxicity criteria are pH dependent, the summer effluent pH of 7.4 which is a median of the maximum effluent pH data (for 7/11-7/16) was used in analysis.</p>
Total Nitrogen as N	<p><u>Regulations:</u> 40 CFR §130.7, OMAR 26.08.02.04, COMAR 26.08.03.01C(3), COMAR 26.08.04.04C, and in addition, the Chesapeake Bay Nutrient Reduction Strategy and the Enhanced Nutrient Removal (ENR) Policy.</p> <p><u>Discussion and Rationale(s):</u> Refer to Section II (Special Requirements and Conditions) on page - 7 for ENR load goal requirements.</p>

III. Proposed Effluent Limits and Monitoring Requirements

Total Phosphorus as P	<p>Regulations: 40 CFR §130.7, COMAR 26.08.02.04, COMAR 26.08.03.01C(3), COMAR 26.08.04.04C, and in addition, the Chesapeake Bay Nutrient Reduction Strategy and the Enhanced Nutrient Removal (ENR) Policy.</p> <p>Discussion and Rationale(s): Refer to Section II (Special Requirements and Conditions) on page - 7 for ENR load goal requirements.</p>
E. Coli	<p>Regulations: 40 CFR §130.7, COMAR 26.08.04.02-1A(2).</p> <p>Discussion and Rationale(s): Limits are set equal to the Bacteria criteria for Use II streams</p>
Total Residual Chlorine	<p>Regulations: COMAR 26.08.02.03-2G(1), COMAR 26.08.02.05C, COMAR 26.08.02.05D, COMAR 26.08.03.06C(5), COMAR 26.08.03.06D, COMAR 26.08.03.06F,</p> <p>Discussion and Rationale(s): The reasonable potential of the Back River WWTP effluent to cause a violation of the receiving stream's TRC water quality criteria was investigated to process the discharge permit renewal. An in-house SPREADSHEET program (developed by the Municipal Surface Discharge Permits Division) is used as a tool for the toxicity analysis. The toxicity based limit was compared with the effluent quality criteria to set the TRC limit requirement.</p>
pH	<p>Regulations: 40 CFR §130.7, COMAR 26.08.02.03-3A(4),</p> <p>Discussion and Rationale(s): The limits are set equal to the stream water quality criteria.</p>
Dissolved Oxygen (DO)	<p>Regulations: COMAR 26.08.02.03-3A(4).</p> <p>Discussion and Rationale(s): The limits are set equal to the stream water quality criteria. Also, refer to Discussion and Additional Rationale for BOD₅.</p>
Flow	<p>Regulations: COMAR 26.08.04.02A(2). The discharge is consistent with the (name of County) water</p> <p>Discussion and Rationale(s): The permit flow considered for this permit renewal is equivalent to the rated design capacity of the facility. It is not a limitation, but it incorporated with concentration limits to calculate the waste load limits for BOD₅, TSS, Ammonia-N, TP and TN}.</p>
WET	<p>Regulations: COMAR 26.08.03.07</p> <p>Discussion and Rationale(s): Refer to Section II "Special Requirements and Conditions" for additional information pertaining to the WET requirements.</p>

III. Proposed Effluent Limits and Monitoring Requirements

Additional Rationales for Effluent Limitations:

(A) Anti-backsliding Policy Review:

Provisions as stipulated in Federal Regulations [CWA §303(d)(4), CWA §402(o) & 40 CFR 122.44(l) require a reissued permit to be as stringent as the previous permit requirements, with some exceptions as determined by the Department.

The effluent limitations established for the permit renewal are in conformance to the above stated provisions.

(B) Anti-Degradation Policy Review:

Waters of this State shall be protected and maintained for existing uses and the basic uses of water contact recreation, fishing, protection of aquatic life and wildlife, and agricultural and industrial water supply as identified in Use I. The discharge permit being processed includes sufficient limits in order to maintain and protect water quality intended for the existing designated uses.

As outlined in COMAR 26.08.02.04 (Anti-degradation Policy), certain waters of the State possess an existing quality that is better than the water quality standards established for them. The quality of these waters shall be maintained unless:

1. The Department determines a change in quality is justifiable as a result of necessary economic or social development; and
2. The change will not diminish uses made of, or presently existing, in these waters.

The discharge permit (15-DP-0581) being processed for the reissuance includes the effluent limitations which are sufficient to protect and maintain the water quality of the Back River. It does not require Tier II antidegradation review for the existing facility with permitted flow of 180.0 MGD.

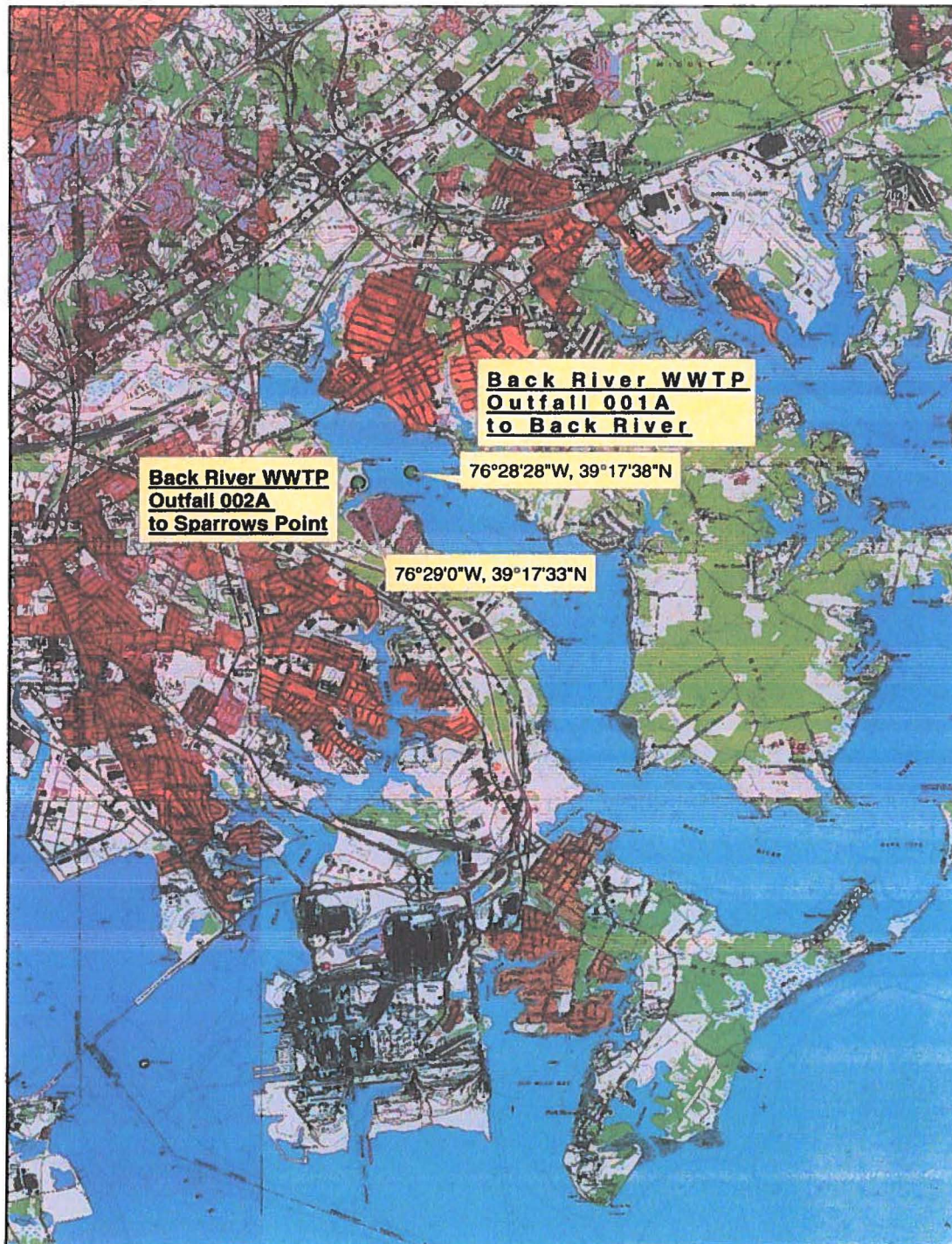
Rationale(s) for Monitoring Requirements:

The Department Guidelines for Minimum Monitoring Requirements as revised by memorandums of 7/24/1996 and 3/6/2008.

**IV. Chronological Log of Meetings, Site Visits, Telephone Calls, etc.
(Reports are in official file):**

DATE	ACTIVITY DESCRIPTION
04/30/2015	The Municipal Surface Discharge Permits Division received discharge permit renewal application dated 04/30/15 completed by Nicholas Frankos, Plant Manager .
02/18/2016	<p>The Municipal Surface Discharge Permits Division sent letters to:</p> <ol style="list-style-type: none"> 1) Honorable Robert B. Long, District 6, House Office Building, Room 235, 6 Bladen Street, Annapolis, MD 21401 2) Honorable Richard W. Metzgar, District 6, House Office Building, Room 307, 6 Bladen Street, Annapolis, MD 21401 3) Honorable Robin L. Grammer, District 6, House Office Building, Room 307, 6 Bladen Street, Annapolis, MD 21401 4) Honorable Johnny Ray Salling, District 6, James Senate Office Building, Room 416, 11 Bladen Street, Annapolis, MD 21401 5) Mr. Andy Galli, Clean Water Action, 1120 N. Charles Street, STE 415, Baltimore, MD 21201-5500 6) Mr. Keith Taylor, 7218 River Drive Road, Sparrows Point, MD 21219 7) Mr. Andrew W. Keir, Staff Attorney, Environmental Law Clinic, University of Maryland, 500 W. Baltimore Street, Baltimore, MD 21201 8) Mr. Russell Sam Donnelly, Group Environmental Coordinator, Environmental Analyst, 2114 Oak Road, Baltimore, MD 21219-2214 9) Mr. William Pribyl, 7538 Battle Grove Circle, Baltimore, MD 21222 10) Ms. Leana S. Wen, M.D. MSc., FAAEM Commissioner, Baltimore City Health Dept, 1001 E. Fayette St., Baltimore, MD 21202 11) Mr. Larry Starr, 7122 Riverdrive Road, Baltimore, MD 21219 12) Mr. Doug Myers, Senior Scientist , Chesapeake Bay Foundation, 6 Herndon Avenue, Annapolis, MD 21403 13) Mr. Francis Taylor, North Point Peninsula Council, P.O. Box 444, Ft. Howard, MD 21052 14) Mr. David Flores, Baltimore Harbor WATERKEEPER Blue Water Baltimore, 3545 Belair Rd, Baltimore, MD 21213
4/4/16	Informational meeting held at North Point Branch of Baltimore County Library to discuss permit application
11/22/2016	Report narrating information gathered during the site visit of <u>11/22/2016</u> along with photographs.

V. MAP SHOWING POINT OF DISCHARGE LOCATION



SCALE 0 0.35 0.7 1.4 2.1 2.8 Miles

BALTIMORE COUNTY

VI. APPENDIX- A**Effluent Limitations and Monitoring Requirements of the Previous Permit (10-DP-0581)**

Permit No. 10-DP-0581 (NPDES D0021555)

Page No. 4 of 29

II. SPECIAL CONDITIONS**A.1 Effluent Limitations, Outfall 001 ⁽¹⁾⁽²⁾⁽⁷⁾**

The quality of the effluent discharged by the facility at a discharge point location- 001 shall be limited at all times as shown below:

Effluent Characteristics	Maximum Effluent Limits					
	Monthly Average Loading Rate, Pounds/day	Weekly Average Loading Rate, Pounds/day	Daily Average Loading Rate, Pounds/day	Monthly Average Concentration, mg/l	Weekly Average Concentration, mg/l	Daily Average Concentration, mg/l
BOD ₅	11,000	16,000	N/A	10	15	N/A
TSS	11,000	16,000	N/A	10	15	N/A
Ammonia-N 5/1-10/31	2,200	3,300	N/A	2.0	3.0	N/A
Ammonia-N 11/1-4/30	6,300	N/A	N/A	5.7	N/A	N/A
Total Phosphorus	220	330	N/A	0.2	0.3	N/A

Effluent Characteristics	Maximum Effluent Limits		
	Total Monthly Loading Rate ⁽⁵⁾ , Pounds/Month	Maximum Loading Rate ⁽⁶⁾ , Pounds	Monthly Average Concentration, mg/l
Total Phosphorus-P ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾ 5/1-10/31	REPORT	6,652 lbs /month	REPORT
Total Phosphorus-P ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾	REPORT	79,277 lbs/yr	REPORT
Total Nitrogen-N ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾ 5/1-10/31	REPORT	99,782 lbs /month	REPORT
Total Nitrogen-N ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾	REPORT	1,582,055 lbs/yr	REPORT

Effluent Characteristics	Effluent Limits	
	Maximum	Minimum
E.coli	126 MPN/ 100 ml monthly geometric mean value	N/A
Total Residual Chlorine ⁽¹⁰⁾	0.012 mg/l or nondetectable level	N/A
pH	8.5	6.5
Dissolved Oxygen (1/1-12/31) (2/1-5/31)	N/A N/A	5.0 mg/l at anytime 6.0 mg/l for a 7-day average
WET Acute Toxicity ⁽¹¹⁾	GUa < 1.00	N/A
WET Chronic Toxicity ⁽¹¹⁾	TUc < 1.02	N/A

An annual average flow of 130.0 million gallons per day (mgd) was used in waste allocation calculations and this unit should be used when reporting on the Discharge Monitoring Report (EPA Form 3320-1, Rev. 01/06). Notification is to be provided to the Department at least 180 days before the annual average flow is expected to exceed this flow level. Upon completion of the ENR upgrade, the discharge from the facility shall meet an annual load limit of 2,192,800 lbs/year for total nitrogen and 109,600 lbs/year for total phosphorus for flows from outfalls 001 and 002 combined together. If a permit modification is required, the Department will initiate the public participation NPDES process.

VI. APPENDIX- A**Effluent Limitations and Monitoring Requirements of the Previous Permit (10-DP-0581)**

Permit No. 10-DP-0581 (NPDES #D0021555)

Page No. 5 of 29

II. SPECIAL CONDITIONS**A.2 Effluent Limitations, Outfall 002 ⁽¹⁾⁽²⁾⁽⁷⁾**

The quality of the effluent discharged by the facility at a discharge point location- 002 shall be limited at all times as shown below:

Effluent Characteristics	Maximum Effluent Limits					
	Monthly Average Loading Rate, Pounds/day	Weekly Average Loading Rate, Pounds/day	Daily Average Loading Rate, Pounds/day	Monthly Average Concentration, mg/l	Weekly Average Concentration, mg/l	Daily Average Concentration, mg/l
BOD ₅ 5/1-10/31	17,000	25,000	N/A	20	30	N/A
BOD ₅ 11/1-4/30	25,000	38,000	N/A	30	45	N/A
TSS	25,000	38,000	N/A	30	45	N/A
Ammonia-N 5/1-10/31	1,700	2,500	N/A	2.0	3.0	N/A
Ammonia-N 11/1-4/30	4,800	N/A	N/A	5.7	N/A	N/A
Total Phosphorus	170	N/A	N/A	0.2	N/A	N/A

Effluent Characteristics	Maximum Effluent Limits		
	Total Monthly Loading Rate ⁽⁵⁾ , Pounds/Month	Maximum Loading Rate ⁽⁶⁾ , Pounds	Monthly Average Concentration, mg/l
Total Phosphorus-P ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾ 5/1-10/31	REPORT	30,440 lbs total 5/1-10/31	REPORT
Total Phosphorus-P ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾ 5/1-10/31	REPORT	60,880 lbs/yr	REPORT
Total Nitrogen-N ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾ 5/1-10/31	REPORT	608,800 lbs total 5/1-10/31	REPORT
Total Nitrogen-N ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁸⁾⁽⁹⁾ 5/1-10/31	REPORT	1,217,600 lbs/yr	REPORT

Effluent Characteristics	Effluent Limits	
	Maximum	Minimum
E.coli	126 MPN/ 100 ml monthly geometric mean value	N/A
Total Residual Chlorine ⁽¹⁰⁾	N/A	N/A
pH	9.0	6.0
Dissolved Oxygen (1/1-12/31) (2/1-5/31)	N/A N/A	5.0 mg/l at anytime 6.0 mg/l for a 7-day average

An annual average flow of 100.0 million gallons per day (mgd) was used in waste allocation calculations and this unit should be used when reporting on the Discharge Monitoring Report (EPA Form 3320-1, Rev. 01/06). Notification is to be provided to the Department at least 180 days before the annual average flow is expected to exceed this flow level or when the sum of flows from outfall 001 and 002 is expected to exceed 180.0 mgd. Upon completion of the ENR upgrade, the discharge from the facility shall meet an annual load limit of 2,192,800 lbs/year for total nitrogen and 109,600 lbs/year for total phosphorus for flows from outfalls 001 and 002 combined together. If a permit modification is required, the Department will initiate the public participation NPDES process.

VI. APPENDIX- A

Effluent Limitations and Monitoring Requirements of the Previous Permit (10-DP-0581)

Permit No. 10-DP-0581 (NPDE. ID0021555)

Page No. 6 of 29

II. SPECIAL CONDITIONS*Footnotes for effluent limitations on pages 4 and 5:*

- (1) When this permit is renewed, the new limitations may not be equal to the above limitations. There shall be no discharge of floating solids or visible foam other than trace amounts.
- (2) The permit may also be reopened in accordance with the requirements of MDE's Watershed Permitting Plan under which all discharge permits in a watershed are issued the same year.
- (3) The ENR upgrade shall be completed according to the following schedule:

- Begin construction - October 1, 2011
- Complete construction - December 31, 2016
- Attain operational level - September 1, 2017

Upon completion of the ENR upgrade, the discharge from the facility shall meet an annual load limit of 2,192,800 lbs/year for total nitrogen and 109,600 lbs/year for total phosphorus for flows from outfalls 001 and 002 combined together. Until the facility's upgrade to the ENR treatment is complete and fully operational (with schedule as listed above), the permittee is to operate the Biological Nutrient Removal (BNR) process on a year round basis and undertake best efforts to meet the TN load goal of 2,192,800 pounds/year for this facility. Total Nitrogen is the sum of ammonia-N, organic-N and (nitrite + nitrate)-N based on samples collected on the same day.

- (4) Until completion of the ENR upgrade, the permittee shall calculate and report the concentration-based annual loading rate, along with the Tributary Strategy-based annual loading rate, and the actual annual nutrient loading rates. The permit Annual Maximum Loading Rate Limits for TN and TP shall become effective September 1, 2017. The loading cap for the year 2017 shall be prorated for the four months from September 1, 2017 through December 31, 2017, and shall be 732,900 pounds for TN and 36,630 pounds for TP. The first exceedance of the permit limit shall be counted and reported as daily exceedances beginning from the first exceedance, determined to the nearest day, through December 31. In addition, after any such exceedance, the permittee shall demonstrate to the Department's satisfaction that the facility is optimizing its nutrient removal capability, and neither the arrival of the next calendar year nor the issuance of a permit renewal during a period of noncompliance shall obviate continuance of any noncompliance status related to treatment optimization requirements.
- (5) Total monthly loading rate (in pounds/month) for nutrients is a calculated parameter to be reported for each calendar month. It is equal to $\{(\text{monthly average concentration, mg/l}) \times (\text{Total flow in a calendar month, Million Gallons}) \times 8.34\}$.
- (6) The Annual Maximum Loading Rate (in pounds/year) for nutrients is a calculated parameter to be reported monthly as the sum of the Total Monthly Loading Rates from January through December of the current calendar year. Upon completion of the ENR upgrade and beginning September 1, 2015, the permittee shall calculate, report and comply with the *concentration-based* loading rate limitation(s) defined below or the *Tributary Strategy-based* loading rate limitation in the above table, whichever is lower:
- (a) TN Limitation (lbs/year): $4.0 \text{ mg/l} \times \text{annual total flow (calendar year based in million gallons per year)} \times 8.34$. To the extent that the permittee alleges that temperature levels of 12 degrees C or lower have diminished the treatment system's capability of complying with this *concentration-based* loading rate limitation for Total Nitrogen, the permittee shall provide notification beginning with the calendar year report under the "Upset" provision in Section III.B.6 of this permit. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.
- (b) TP Limitation (lbs/year): $0.20 \text{ mg/l} \times \text{annual total flow (calendar year based in million gallons per year)} \times 8.34$.

The details and results of all required annual calculations shall be submitted to the Department with the Discharge Monitoring Report for December. The concentration based loading requirements may be revised if the limits or schedule are determined to be impracticable based on actual performance and the Department re-opens the permit as a major modification (which requires public participation) to impose (an) alternate effluent limitation(s) or revised schedule.

VI. APPENDIX- A**Effluent Limitations and Monitoring Requirements of the Previous Permit (10-DP-0581)**

Permit No. 10-DP-0581 (NPDES .D0021555)

Page No. 7 of 29

II. SPECIAL CONDITIONS**A. Effluent Limitations, Continued***Footnotes for effluent limitation on pages 4 and 5, Continued*

(7) In the future, if a "bubble" watershed discharge permit for Back River and Severstal Steel, LLC, is issued, after appropriate public participation process, then the combined annual maximum loading limits for total nitrogen and total phosphorus of the watershed permit may supersede the tributary strategy based loading rate limitations.

(8) The permittee may request that the permit be reopened and modified to include nutrient trading consistent with the most current "Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed" guidelines.

(9) The Back River (Basin Code 02-13-09-01) was identified on the State's list of WQLSs for total nitrogen, total phosphorus, total suspended solids, Chlordane (all 1996 listing), Polychlorinated biphenyls (1998 listing), Combination Benthic/Fishes Bioassessments (2002 listing) and PCB in fish tissue (2008 listing). The nutrient Total Maximum Daily Load (TMDL) for discharge to the Back River through Outfall 001, approved by the EPA on June 29, 2005 allocated a total nitrogen load of 99,782 lbs/month and total phosphorus load of 6,652 lbs/month for the growing season (May 1 thru October 31). An annual average load of 1,582,055 lbs/yr for total nitrogen and 79,277 lbs/yr for total phosphorus is also allocated and the parameter limits are in conformance with this TMDL.

Another TMDL was also approved by the EPA on March 20, 2001 for Chlordane for the Baltimore Harbor. This permit is consistent with that TMDL.

When TMDLs for other remaining parameters are completed, limits may be imposed, after the public participation process.

(10) Total residual chlorine limitation shall apply only if chlorine or any chlorine-containing compound is used in the wastewater treatment. The wastewater shall be dechlorinated to reduce effluent total residual chlorine concentration to the non-detectable level (See definition I.N). The minimum level (quantification level) for total residual chlorine is 0.10 mg/l. The permittee may report all results below the minimum level as <0.10 mg/l. All results reported below the minimum level shall be considered in compliance.

(11) Whole Effluent Toxicity (WET):
Quarterly WET monitoring without limits is required upon the effective date of this permit. The WET limitations on page 4 shall become effective on September 1, 2015. After September 1, 2015, a Toxicity Reduction Evaluation (TRE) shall be conducted in accordance with Special Condition II.E upon the finding and confirmation of acute or chronic whole effluent toxicity in accordance with Special Condition II.D.10. WET limits remain in effect and quarterly WET testing shall continue until a successful TRE has identified and corrected the cause of toxicity through a chemical specific limit. If, after September 1, 2015 there is no need for a TRE, and all previous testing required by the permit has shown no reasonable potential to violate the WET limits, the permittee may petition MDE to modify the permit to remove the WET limits and reduce the WET monitoring frequency.

TUa is defined as 100 divided by the LC₅₀ value resulting from the first 48 hours of a valid acute or chronic toxicity test. Compliance with the LC₅₀ requirements shall be determined through testing performed in accordance with Special Condition II.D. TUc is defined as 100 divided by the IC₂₅ value resulting from a valid chronic toxicity test. Compliance with the IC₂₅ requirements shall be determined through testing performed in accordance with Special Condition II.D.

VI. APPENDIX- A**Effluent Limitations and Monitoring Requirements of the Previous Permit (10-DP-0581)**

Permit No. 10-DP-0581 (NPDES ID0021555)

Page No. 8 of 29

II. SPECIAL CONDITIONS**B. Minimum Monitoring Requirements for Outfalls 001 and 002:**

The effluent characteristics listed below shall be monitored as follows:

<u>Effluent Characteristics</u> ⁽¹⁾	<u>Measurement Frequency</u>	<u>Sample Type</u>
BOD ₅	One/day	24 hr. Composite
Total Suspended Solids	One/day	24 hr. Composite
Ammonia Nitrogen ⁽²⁾ as N	One/day	24 hr Composite
Total Phosphorus as P ⁽²⁾	One/day	24 hr. Composite
Total Nitrogen as N ⁽³⁾	One/day	24 hr. Composite
(Nitrite + Nitrate) as N ⁽²⁾	One/day	24 hr. Composite
Organic Nitrogen as N ⁽²⁾	One/day	24 hr. Composite
Orthophosphate as P ⁽²⁾	Two/month	24 hr. Composite
E.coli	One/day	Grab
Total Residual Chlorine ⁽⁴⁾	See Footnote- 4	See Footnote- 4
Dissolved Oxygen	Three/day	Grab
pH	Three/day	Grab
Flow ⁽⁵⁾	Continuous	Recorded ⁽⁶⁾
Chlordane ⁽⁷⁾	One/month	24 hr Composite
Endrin ⁽⁷⁾	One/month	24 hr Composite
PCB ⁽⁷⁾	One/month	24 hr Composite
Whole Effluent Toxicity ⁽⁸⁾	One/Quarter	24 Hr Composite

VI. APPENDIX- A**Effluent Limitations and Monitoring Requirements of the Previous Permit (10-DP-0581)**

Permit No. 10-DP-0581 (NPDES MD0021555)

Page No. 9 of 29

II. SPECIAL CONDITIONS**B. Minimum Monitoring Requirements, Continued:***Footnotes for the monitoring requirements, continued:*

- (1) "STORET" (short for STORage and RETrieval) is a widely-used repository for water quality data reporting and monitoring. The corresponding STORET codes for the effluent characteristics specified in Special Conditions II.A and II.B are: BOD5 (00310), Total Suspended Solids (00530), Total Ammonia Nitrogen as N (00610), Total Phosphorus as P (00665), Total Nitrogen as N (00600), (Nitrite + Nitrate) as N (00630), Organic Nitrogen as N (00605), Orthophosphate as P (04175), E.Coli (51040), Total Residual Chlorine (50060), Dissolved Oxygen (00300), pH (00400), Flow (50050), Total monthly flow (82220), Chlordane (39350), Endrin (39390), PCB (79819), WET Acute Toxicity (TS000) and WET Chronic Toxicity (TI000).
- (2) Monitor only; parameters shall be reported on the monthly operating report as individual results and on the Discharge Monitoring Report (EPA Form 3320-1) as monthly average concentration and monthly loading rates. In addition, along with the Discharge Monitoring Report for December each year, the annual loading rate, which is the sum of the monthly loading rates from January through December, and annual average concentration shall be reported.
- (3) Beginning with the effective date of this permit, the permittee shall report on each monthly Discharge Monitoring Report the cumulative TN and TP load for the calendar year in question. The cumulative load is calculated by summing the monthly loading values for each month in that calendar year. TN and TP concentrations will be reported as a monthly average. Total nitrogen is the sum of Total Ammonia- N, Organic-N and (nitrite + nitrate)-N. All nitrogen parameters shall be measured on the same daily samples.
- (4) The minimum monitoring requirements of three per day and one per shift, grab sampling for total residual chlorine shall be applicable, only when the wastewater at the Back River WWTP is treated with chlorine or any chlorine compound. The minimum detection level (quantification level) for total residual chlorine is 0.10 mg/l. The permittee may report all results below the minimum level as <0.10 mg/l. All results reported below the minimum level shall be considered in compliance.
- (5) Flows shall be reported to at least the nearest 10,000 gallons. For each calendar month, they shall be reported as follows: (a) On the Monthly Operating Reports, the permittee shall report the following three flows: (1) actual daily flow (in Million Gallons (MG)), (2) total monthly flow (in MG) and (3) monthly average flow (in mgd); and (b) On the Discharge Monitoring Reports (EPA Form 3320-1, Rev. 01/06), the permittee shall report three flows as follows (1) monthly average flow (MGD), (2) daily maximum flow (MGD) and (3) total monthly flow (MG). Total monthly flow is a calculated parameter equal to sum of the daily flow results in a calendar month. (Example: A flow of 1,570,899 gallons per day shall be reported as 1.57 mgd.)
- (6) Continuous electronic flow measurement and recording which can produce a permanent record are acceptable to the Department.
- (7) All toxic chemical monitoring required by this permit shall be performed in accordance with MDE's Water Management Administration Toxic Substance Analytical Protocol. This includes analytical methodology, detection levels, holding times, preservation methods, sample types, and reporting.
- (8) Whole Effluent Toxicity (WET) samples shall be collected, analyzed, and reported in accordance with the MDE Water Management Administration's "Effluent Biototoxicity Testing Protocol for Industrial and Municipal Effluents" and Special Condition II.D.